

Highway Hydraulics Division-Rahul S K

BY: BTOMPSON

SECTION 705 - TURF ESTABLISHMENT

705.01 DESCRIPTION. THIS WORK SHALL CONSIST OF SOIL PREPARATION, SEEDING, FERTILIZING, LIMING, MULCHING, OVERSEEDING, REFERTILIZATION, AND MOWING ALL AREAS DESIGNATED FOR TURF ESTABLISHMENT AS SPECIFIED IN THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER. LIMING AND FERTILIZING RATES WILL BE DETERMINED BY THE NUTRIENT MANAGEMENT PLAN.

705.01.01 REGIONAL AREAS. MARYLAND IS DIVIDED INTO REGIONS BY COUNTIES AS FOLLOWS:

REGION 1 - GARRETT, ALLEGANY AND WASHINGTON (WEST OF CLEAR SPRING, MD);

REGION 2 - WASHINGTON (EAST OF CLEAR SPRING, MD), FREDERICK, CARROLL, BALTIMORE, HARFORD, CECIL, HOWARD, MONTGOMERY, AND BALTIMORE CITY.

REGION 3 - ANNE ARUNDEL, PRINCE GEORGE'S, CALVERT, CHARLES, ST. MARY'S, KENT, QUEEN ANNE'S, TALBOT, CAROLINE, DORCHESTER, WICOMICO, WORCESTER AND SOMERSET.

705.01.02 SEEDING SEASONS AND SEED MIXES.

SEEDING SEASONS AND SEED MIXES			
SEASONS	SPRING AND FALL MONTH/DAY	SUMMER MONTH/DAY	LATE FALL MONTH/DAY
REGIONS	PERMANENT SEED MIX		
1	4/1 TO 6/15 AND 8/1 TO 10/1	6/16 TO 7/31	10/2 TO 11/1
2	3/1 TO 5/15 AND 8/1 TO 10/20	5/16 TO 7/31	10/21 TO 11/20
3	3/3 TO 5/1 AND 8/1 TO 10/31	5/2 TO 7/31	11/1 TO 11/30
1, 2, AND 3	NO ADDITIVES	PLUS ADDITIVE A	PLUS ADDITIVE B
	PLUS ADDITIVE C FOR SEEDING: A. AREAS 30 FT AND GREATER FROM THE EDGE OF THE PAVEMENT B. SLOPES 4:1 AND STEEPER		
	WHEN SEEDING AREAS WITHIN 4 MILES OF A STATE AIRPORT: A. FLATTER THAN 4:1 - NO ADDITIVES B. 4:1 AND STEEPER - SPECIAL PURPOSE SEED MIX IN LIEU OF PERMANENT SEED MIX		
	ADDITIVES A = LOVEGRASS OR FOXTAIL MILLET B = TEMPORARY SEED MIX C = SERICEA LESPEDEZA		

705.02 MATERIALS.

AGRICULTURAL LIMESTONE 9
FERTILIZER 920.03.01
GYPSUM 920.03.05
SULFUR (90%) 920.03.06
SEED 920.04.01 AND 920.04.02
MULCH 920.05.03 AND 920.05.04
MULCH BINDER 920.05.04
MISCELLANEOUS 920.08

705.02.01 SOIL SAMPLING AND TESTING. SOIL SAMPLING AND TESTING SHALL BE COMPLETED IN CONFORMANCE WITH MSMT 356. THE SOIL SHALL BE TESTED FOR PH, ORGANIC MATTER, GRADING ANALYSIS, USDA TEXTURAL ANALYSIS, PHOSPHORUS, AND POTASSIUM. THIS PROCEDURE IS ALSO USED BY THE LANDSCAPE OPERATIONS DIVISION (LOD) TO DEVELOP A NUTRIENT MANAGEMENT PLAN (NMP) F

705.03 CONSTRUCTION. SEEDING SHALL BE PERFORMED WHEN THE TEMPERATURE IS ABOVE 32 F AND THE GROUND IS NOT FROZEN.

705.03.01 PERMANENT SEEDING. SEEDING SHALL CONSIST OF SOIL PREPARATION, SEEDING, FERTILIZING, AND APPLYING AND SECURING MULCH. WHERE REQUIRED, WORK SHALL ALSO INCLUDE APPLYING ANY OF THE FOLLOWING: GYPSUM, LIMESTONE, AND SULFUR.

(A) PREPARING SOIL. AREAS TO BE SEEDDED SHALL CONFORM TO THE SPECIFIED FINISH GRADES AND BE FREE OF ANY WEED OR PLANT GROWTH. ALL GULLIES, WASHES, OR DISTURBED AREAS THAT DEVELOP SUBSEQUENT TO FINAL DRESSING SHALL BE REPAIRED PRIOR TO SEEDING. IMMEDIATELY PRIOR TO SEEDING, TOPSOILED AND NONTOPSOILED AREAS SHALL BE LOOSENEED BY DISCING, HARROWING, RAKING, OR BY OTHER APPROVED METHODS AT THE FOLLOWING DEPTHS:

- (1) TOPSOILED AREAS 4 IN. AND GREATER. THE TOPSOIL SHALL BE LOOSENEED TO A DEPTH OF 3 IN.
- (2) TOPSOILED AREAS 2 IN. THE TOPSOIL SHALL BE LOOSENEED TO A DEPTH OF 2 IN.
- (3) NONTOPSOILED AREAS. THE SUBSOIL SHALL BE LOOSENEED TO A DEPTH OF 1 IN.

THE AREA SHALL BE FREE OF ALL CLOUDS, STONES, AND OTHER FOREIGN MATERIALS LARGER THAN 3 IN. ON AND ADJACENT TO COMMERCIAL AND RESIDENTIAL PROPERTIES, THE SIZE OF STONES AND OTHER FOREIGN MATERIAL SHALL NOT BE LARGER THAN 1-1/2 IN. TO CONSERVE MOISTURE, A CULTIPACKER MAY BE RUN OVER THE SEEDBED BEFORE OR AFTER SEEDING, BUT BEFORE MULCHING.

ON AREAS FLATTER THAN 4:1, THE FINAL SEEDBED SHALL BE PREPARED SO THERE IS AN EVEN AND UNIFORM SURFACE; ALL BULLDOZER CLEAT MARKS SHALL BE REMOVED. SLOPES 4:1 AND STEEPER EXCLUDING SERRATED CUT SLOPES SHALL BE TRACKED AS SPECIFIED IN 701.03.02(D).

SERRATED CUT SLOPES SHALL NOT BE LOOSENEED. THE AREAS SHALL BE SEEDDED AND MULCHED IN 50 FT MAXIMUM VERTICAL INCREMENTS.

(B) APPLICATION EQUIPMENT. EQUIPMENT SHALL CONSIST OF SPREADERS, DRILLS, HYDROSEEDERS, OR OTHER EQUIPMENT APPROVED BY THE ENGINEER FOR APPLYING MATERIALS EITHER IN A WET OR DRY FORM. ALL EQUIPMENT SHALL BE CALIBRATED BEFORE APPLICATION TO THE SATISFACTION OF THE ENGINEER SO THAT MATERIALS ARE APPLIED ACCURATELY AND EVENLY TO AVOID MISSES AND OVERLAPS.

HYDROSEEDERS SHALL DISPLAY MAXIMUM CAPACITY IN GALLONS AND BE EQUIPPED WITH AN AGITATION SYSTEM CAPABLE OF KEEPING ALL THE SOLIDS IN SUSPENSION.

THE MIXTURE SHALL BE DIRECTED SO THE DROPLETS PRODUCE A UNIFORM SPRAY TO AVOID EROSION OR RUNOFF.

MECHANICAL SEEDERS SHALL BE CAPABLE OF PLACING SEED AT THE SPECIFIED RATE.

USE OF HYDROSEEDERS AND SPINNER SPREADERS IS PROHIBITED DURING WINDY PERIODS WHEN THE MATERIALS COULD LAND ON SENSITIVE AREAS OR ON SENSITIVE STRUCTURES.

SPECIAL PROVISION INSERT - SECTION 705 TURF ESTABLISHMENT

(C) APPLICATION RATES.

MATERIAL	LB PER ACRE
AGRICULTURAL LIMESTONE SALVAGED TOPSOIL AREAS, FURNISHED TOPSOIL AREAS, NONTOPSOILED AREAS AND SERRATED CUT SLOPES (A) REGIONS 1 AND 2 LIMESTONE (B) REGION 3 DOLOMITIC LIMESTONE	SPECIFIED IN NUTRIENT MANAGEMENT PLAN UP TO 8700 UP TO 8050
SEED PERMANENT SEED MIX AREAS THAT ARE: (A) LESS THAN 30 FT FROM THE PAVEMENT EDGE AND ARE FLATTER THAN 4:1 (B) AT FACILITIES	150
SEED PERMANENT SEED MIX SERICEA LESPEDEZA AREAS THAT ARE: (A) 30 FT AND GREATER FROM THE EDGE OF THE PAVEMENT AND/OR (B) 4:1 AND STEEPER	100 20
SEED SPECIAL PURPOSE SEED MIX FOR SLOPES 4:1 AND GREATER GREATER WITHIN FOUR MILES OF A STATE AIRPORT	150
SEED TEMPORARY SEED MIX LOVEGRASS FOXTAIL MILLET	25 2 10
FERTILIZER AT SEEDING TOPSOILED AREAS 10-22-22 (50 % UREAFORM NITROGEN) 38-0-0 (UREAFORM) 0-0-60 NONTOPSOILED AREAS 10-22-22 (50 % UREAFORM NITROGEN) 38-0-0 (UREAFORM) 0-0-60	SPECIFIED IN NUTRIENT MANAGEMENT PLAN UP TO 1000 UP TO 130 UP TO 180 UP TO 1000 UP TO 250 UP TO 200
REFERTILIZING TOPSOILED AREAS 5-20-20 38-0-0 (UREAFORM) NONTOPSOILED AREAS 5-20-20 38-0-0 (UREAFORM)	100 400 400 600
MULCH (A) STRAW OR HAY (1) SECURED WITH WOOD CELLULOSE FIBER (2) SECURED WITH MULCH ANCHORING TOOL (3) SECURED WITH THE TRACKING METHOD (B) WOOD CELLULOSE FIBER	4000 5000 3000 1500
MULCH BINDER WOOD CELLULOSE FIBER	750

(D) LIMING. AGRICULTURAL LIMESTONE WHERE REQUIRED ON TOPSOILED AREAS FLATTER THAN 4:1, SHALL BE INCORPORATED INTO THE TOPSOIL BEFORE SEED AND FERTILIZER ARE APPLIED AT THE FOLLOWING DEPTHS:

- (1) 4 IN. OF TOPSOIL AND GREATER. THE LIMESTONE SHALL BE INCORPORATED TO A DEPTH OF 3 IN.
- (2) 2 IN. OF TOPSOIL. THE LIMESTONE SHALL BE INCORPORATED TO A DEPTH OF 2 IN.

AGRICULTURAL LIMESTONE WHERE REQUIRED ON ALL AREAS 4:1 AND STEEPER, WILL NOT REQUIRE INCORPORATION AND MAY BE MIXED WITH THE SEED AND FERTILIZER PRIOR TO PERMANENT SEEDING.

(E) GYPSUM AND SULFUR (90%). WHEN GYPSUM OR SULFUR (90%) ARE REQUIRED, NEITHER SHALL BE INCORPORATED INTO THE TOPSOIL OR SUBSOIL.

(F) SEEDING AND FERTILIZING. SEED AND FERTILIZER SHALL ONLY BE APPLIED TO PREVIOUSLY PREPARED SEEDBEDS.

WHEN SEED IS APPLIED WITH HYDRAULIC SEEDERS, ALL MIXTURES SHALL BE USED WITHIN EIGHT HOURS AFTER MIXING.

WHEN SEED IS SOWN WITH MECHANICAL SEEDERS, SEED AND FERTILIZER SHALL BE INCORPORATED TO A DEPTH NOT MORE THAN 1/4 IN.

ALL LEGUMINOUS SEEDS SHALL BE INOCULATED AS SPECIFIED ON THE INOCULANT PACKAGE LABEL. THE INOCULANT SHALL BE STORED AT ROOM TEMPERATURES, OUT OF DIRECT SUNLIGHT AND AWAY FROM HEATING UNITS.

WHEN LEGUMINOUS SEED IS SOWN BY HYDRAULIC SEEDERS, 10 TIMES THE QUANTITY OF INOCULANT REQUIRED FOR DRY LEGUMINOUS SEED APPLICATION SHALL BE USED. SEED NOT USED WITHIN ONE HOUR SHALL BE REINOCULATED.

WHEN LEGUMINOUS SEED IS SOWN BY MECHANICAL SEEDERS, THE SEED SHALL BE DAMPENED WITH WATER AND MIXED WITH THE INOCULANT. THE INOCULATED SEED SHALL THEN BE MIXED WITH THE OTHER SEED TO BE USED. INOCULATED SEED NOT USED WITHIN 24 HOURS SHALL BE REINOCULATED.

(G) MULCHING. WITHIN 48 HOURS AFTER SEEDING, MULCH SHALL BE APPLIED AS FOLLOWS:

- (1) STRAW OR HAY MULCH. MATERIAL SHALL BE APPLIED SO NO MORE THAN 10 PERCENT OF THE SOIL SURFACE IS EXPOSED. MULCH APPLIED BY BLOWERS SHALL PROVIDE A LOOSE DEPTH OF 1/2 TO 2 IN. AT LEAST 95 PERCENT OF THE MULCH SHALL BE 6 IN. OR MORE IN LENGTH. MULCH APPLIED BY HAND SHALL PROVIDE A LOOSE DEPTH OF 1 3 TO 3 IN.
- (2) WOOD CELLULOSE FIBER MULCH. WOOD CELLULOSE FIBER WILL ONLY BE PERMITTED ON THOSE AREAS WHERE STEEP OR HIGH SLOPES PROHIBIT THE USE OF STRAW OR HAY APPLICATION EQUIPMENT OR WHEN APPROVED BY THE ENGINEER. DURING SUMMER SEEDING AT LEAST 70 PERCENT OF THE HYDROMULCH SHALL BE APPLIED AFTER AND SEPARATELY FROM THE SEED AND FERTILIZER.

(H) SECURING STRAW OR HAY MULCH. MULCH SHALL BE SECURED BY ANY OF THE FOLLOWING METHODS:

(1) MULCH ANCHORING TOOL METHOD. THIS METHOD SHALL BE USED FOR THE SUMMER SEEDING SEASON ON AREAS FLATTER THAN 4:1 AND ALL MEDIAN AREAS ON HIGHWAYS UNDER TRAFFIC. MULCH SHALL BE INCORPORATED INTO THE SOIL TO A MINIMUM DEPTH OF 2 IN.

(2) TRACKING METHOD. THE MULCH SHALL BE INCORPORATED INTO THE SOIL WITH TRACK TYPE EQUIPMENT HAVING STEEL CLEATS WITH A MINIMUM DEPTH OF 1-1/2 IN. THE TRACKING SHALL BE PERFORMED PERPENDICULAR TO THE SLOPES. THE EQUIPMENT USED AND THE METHOD OF TRACKING SHALL BE ACCEPTABLE TO THE ENGINEER. UPON COMPLETION OF TRACKING, THE MULCH SHALL BE FURTHER SECURED AS DESCRIBED FOR THE MULCH BINDING METHOD IN 705.03.01(G)(3).

(3) MULCH BINDING METHOD. MULCH BINDER MATERIAL SHALL BE UNIFORMLY APPLIED WITHOUT DISPLACING THE MULCH.

705.03.02 NONTOPSOILED AREAS. ALL NONTOPSOILED AREAS TO BE SEEDDED SHALL HAVE LIMESTONE AND 38-0-0 (UF) FERTILIZER APPLIED.

705.03.03 OVERSEEDING. OVERSEEDING PERMANENT SEEDING AREAS CONSISTS OF APPLYING SEED AND FERTILIZER TO PREVIOUSLY SEEDDED AND MULCHED AREAS WHERE TURF ESTABLISHMENT HAS NOT BEEN SUCCESSFUL AND WHERE REMULCHING IS NOT REQUIRED DUE TO MULCH REMAINING FROM THE PREVIOUS MULCH APPLICATION. WORK SHALL BE AS DIRECTED BY THE ENGINEER AND CONFORM TO 705.03.01 AND .02. SOIL PREPARATION AND MULCH WILL NOT BE REQUIRED.

705.03.04 REFERTILIZING. REFERTILIZING SHALL CONSIST OF APPLYING 5-20-20 AND 38-0-0 (UF) FERTILIZER TO TOPSOILED, NONTOPSOILED AND SERRATED CUT SLOPE AREAS, AND OTHER AREAS AS DIRECTED BY THE ENGINEER AS FOLLOWS:

AREAS	REGIONS	NUMBER OF APPLICATIONS	MONTHS/WEEKS AFTER SEEDING
TOPSOILED	1 AND 2	1	4 TO 6 WEEKS
NONTOPSOILED AND SERRATED CUT SLOPES	1 AND 2	1	APRIL OR SEPTEMBER
	3	2	APRIL AND SEPTEMBER

705.03.05 TRACTOR MOWING. MOWING SHALL CONSIST OF USING A MINIMUM 5 FT FLAIL OR ROTARY TRACTOR MOWER AS DIRECTED BY THE ENGINEER, AND SHALL CONFORM TO THE ADMINISTRATION'S MOWING GUIDELINES. THE VEGETATION SHALL BE CUT TO 5 IN. HIGH BEFORE IT REACHES 20 IN. HIGH.

705.03.06 HAND MOWING. MOWING SHALL CONSIST OF USING A MINIMUM 19 IN. HAND MOWER AS DIRECTED BY THE ENGINEER. VEGETATION SHALL BE CUT TO 3 TO 4 IN. HIGH BEFORE IT REACHES 15 IN. HIGH.

705.03.07 TURF COVERAGE. THE CONTRACTOR SHALL PROVIDE AN ACCEPTABLE STAND OF TURF AS SPECIFIED IN THE CONTRACT DOCUMENTS AT THE SEMI-FINAL AND FINAL INSPECTIONS AS DETERMINED BY THE ENGINEER AND A REPRESENTATIVE FROM THE LANDSCAPE OPERATIONS DIVISION. THE TURF SHALL HAVE A DARK GREEN COLOR AND SHALL COMPRISE 3F THE FOLLOWING MINIMUM TURF COVERAGE:

(A) 95 PERCENT COVERAGE (FOR ALL AREAS EXCEPT FOR AREAS 4:1 AND STEEPER TRACKED WITH A BULLDOZER) OF:

(1) PERMANENT SEED MIX OR SERICEA LESPEDEZA OR

(2) SPECIAL PURPOSE SEED MIX WITHIN FOUR MILES OF A STATE AIRPORT.

(B) 50 PERCENT COVERAGE (FOR AREAS 4:1 AND STEEPER TRACKED WITH A BULLDOZER) OF:

(1) PERMANENT SEED MIX AND/OR SERICEA LESPEDEZA OR

(2) SPECIAL PURPOSE SEED MIX WITHIN FOUR MILES OF A STATE AIRPORT.

705.03.08 REPAIRING DAMAGED AREAS. BEFORE FINAL ACCEPTANCE THE CONTRACTOR SHALL REPAIR OR REPLACE ANY SEEDING OR MULCHING THAT IS DEFECTIVE OR DAMAGED DUE TO THE CONTRACTOR'S NEGLIGENCE AS DEEMED BY THE ENGINEER AT NO ADDITIONAL COST TO THE ADMINISTRATION. WHEN THE CONTRACTOR ELECTS TO PERFORM OUT OF SEASON WORK, THE CONTRACTOR SHALL ESTABLISH A GOOD STAND OF TURF OF UNIFORM COLOR AND DENSITY AS APPROVED BY THE ENGINEER. WHEN IT IS NOT POSSIBLE TO MAKE AN ADEQUATE DETERMINATION OF THE COLOR, DENSITY AND UNIFORMITY OF THE TURF, ACCEPTANCE OF THE AREAS WILL BE DELAYED UNTIL SEEDING REQUIREMENTS ARE IN CONFORMANCE.

705.04 MEASUREMENT AND PAYMENT. TURF ESTABLISHMENT WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE FOR THE ITEMS AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE PAYMENT WILL BE FULL COMPENSATION FOR ALL MATERIAL, LABOR, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

705.04.01 PERMANENT SEEDING AREAS PER SQUARE YARD. THIS ITEM INCLUDES PREPARING SOIL AND SEED BED, APPLYING SEED (MIXES AND ADDITIVES), FERTILIZERS (OUTLINED IN THE NUTRIENT MANAGEMENT PLAN), OVERSEEDING, AND MULCH.

705.04.02 APPLYING GYPSUM TO SALVAGED TOPSOIL AND NONTOPSOILED AREAS PER TON.

705.04.03 APPLYING SULFUR (90%) TO SALVAGED TOPSOIL AND NONTOPSOILED AREAS PER TON.

705.04.04 LIMING SALVAGED TOPSOIL AND NONTOPSOILED AREAS PER TON.

705.04.05 FERTILIZING NONTOPSOILED AREAS WITH 38-0-0 (UREAFORM) FERTILIZER PER POUND.

705.04.06 REFERTILIZING TOPSOILED AREAS PER POUND FOR THE COMBINED WEIGHT PER POUND OF 5-20-20 AND 38-0-0 (UREAFORM) FERTILIZERS.

705.04.07 REFERTILIZING NONTOPSOILED AREAS PER POUND FOR THE COMBINED WEIGHT PER POUND OF 5-20-20 AND 38-0-0 (UREAFORM) FERTILIZERS.

705.04.08 MOWING PER HOUR. THIS ITEM INCLUDES TRACTOR AND HAND MOWING.

705.04.09 REPAIRING DAMAGED AREAS. ONCE SEEDING AND MULCHING HAVE BEEN COMPLETED, NO ADDITIONAL WORK AT THE CONTRACTOR'S EXPENSE WILL BE REQUIRED. REPAIRS AND REPLACEMENTS SHALL BE MADE BY THE CONTRACTOR AND WILL BE PAID FOR AS ADDITIONAL WORK, EXCEPT WHEN THE ENGINEER DETERMINES THAT THE DEFECT OR DAMAGE IS DUE TO THE CONTRACTOR'S NEGLIGENCE.

SPECIAL PROVISIONS INSERT CONTRACT NO. M02825185

SHEET NOT USED

REVISIONS		SPECIAL PROVISIONS-TURF ESTABLISHMENT	
SCALE 1" = 1'		DATE 04/21/2005	CONTRACT NO. M02825185
DESIGNED BY _____		COUNTY _____	
DRAWN BY _____		LOGMILE _____	
CHECKED BY _____		F.A.P. NO. _____	
DRAWING NO. SP--1		OF SP-1	SHEET NO. 4 OF 42